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EXAMINER
ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/928,833

Applicant(s)

MATSUI ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant are presented after the first rejection to which they are directed.
2. Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The claims already specifies that the wavelength is 660 nm or less, so the recitation in claim 5 that the wavelength is 700 nm or less does not narrow the claim.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,5-9, 13 and 14 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Nanba et al. JP 60-204396.

Nanba et al. JP 60-204396 teaches the absorption of dyes D32 (perchlorate) and D36 (bromide) in the table on page 29. The absorption maxima of dye D36 is 880 nm and the reflection maxima is 970 nm. The wavelength used in recording is 830 nm (page 29, left column) for the examples disclosed in table 1 on page 30. **Example 3 uses dye D36, which has absorption maxima at wavelengths greater than 830 nm together with dye D32 and metal chelate Q3-12. The chelate is present in an amount of 4 parts to five parts of D36.** The use of dyes which have an absorption maxima within the range 40 nm shorter and 70 nm longer than the writing wavelength is disclosed in the abstract. The use of lasers including HeNe (632.8 nm), Argon ion (488, 514.5 nm), HeCd (442 and 325 nm) is disclosed on page 28 in the lower left hand column. Useful counterions include perchlorate, tetrafluoroborate, aryl sulfonic acids (page 8, right hand column)

The applicant labors under the illusion that the claims are methods of use claims. The examiner notes that this is an intended use limitation and points out that the lasers described as useful with these optical recording media (HeNe (632.8 nm), Argon ion (488, 514.5 nm), HeCd (442 and 325 nm) is disclosed on page 28 in the lower left hand column) support the examiner's contention of their inherent ability to be used with shorter wavelength lasers. The applicant really fails to appreciate the teachings of Nanba et al. JP 60-204396 which clearly teaches that the wavelength of the laser used in recording can be 70 nm less than the absorption maxima of the dye. This is directly parallel to the teachings at [0026] of the applicants specification/prepub. Please note the counterions.

The applicant argues that the limitations of the claims are not met. This seems to ignore the quencher used in the cited example.

6. Claims 1, 2, 5-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanba et al. JP 60-204396.

For the embodiments within the scope of coverage sought where the dye is a cyanine dyes as set forth in claims 2, it would have been obvious to one skilled in the art to use other disclosed cyanine dyes and or counterions from the table on pages 9-14 or page 8 and to use these with appropriate disclosed lasers, such as the HeCd, Ar ion or HeNe, which have emissions at wavelengths up to 70 nm shorter than the maximum absorption of the dyes with a reasonable expectation of successfully writing data into the recording layer based upon the disclosure of using dyes which have absorption maxima up to 70 nm longer than the emission wavelength of the laser.

The applicant's claims clearly embrace embodiments where more than one absorber is present and the absorber, which responds to the shorter wavelength is used for the recording. Clearly, based upon the prior art of record, the heptamethine dyes absorb in the 730-810 nm range (see figure 1 of the instant specification as well). The examiner points out that figure 1 only shows the absorption spectrum of one of the dyes, not the entire composition. When an azo dye is added, the combination would then contain a dye useful with lasers in the 630-830 nm range. (see page 11 of Aihara et al. EP 0676751) As seen in example 15 in table 5 on page 36 of Aihara the metallized azo dye has an absorption maxima at 570 nm and the absorption maxima of the cyanine dye is at 820 nm. (a similar teaching is provided in Umehara et al. JP 08-156408) The issue of Nanba et al. JP 60-204396 is similar in that with two different cyanine dyes, the cyanine dye D36 has an absorption maxima at 970 nm (page 29) and that of dye D32 is 870 nm. (page 29). Further, while the article claims require that the medium be able to be written upon

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using light of 660 nm or less, the method claims do not limit the wavelength used until claim 12. Due to the presence of aromatic moieties (benzene), these cyanine dyes inherently will also absorb in the UV (400 nm or less). The longer wavelength absorption are based upon the length of the methine chain. The examples of Nanba et al. JP 60-204396 use 830 nm laser light, but HeCd, Ar ion or HeNe lasers, which inherently emit at 442, 488, 514.5 and 630 nm respectively are disclosed as useful, with appropriate choice of the cyanine dyes. The general concept of the applicant's invention, within the scope of the claims, in that dyes may have an absorption maximum of up to 70 nm longer than the emission of the laser used is specifically discussed in the abstract of Nanba et al. JP 60-204396. The examiner notes that this document does not disclose metallized azo dyes or nitroso compounds, but discloses other metallized compounds as set forth on page 19-26.

7. Claims 1,4-8 and 11-14 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Umehara et al. JP 08-156408.

See examples 2,3,6 and 7 and comparative example 4 (in translation) where the dyes B1 and B2 are heptamethine cyanine dyes with absorption maxima at 800 and 820 nm (table 1,[0035]) and are paired with azo dyes which have absorption maxima in the 570-610 nm region and are recorded using 780 nm lasers. In section [0030] it appears that a 635 nm laser was used to record data "it was record" and in section [0037-0038] it appears that a 630 nm HeNe laser was used to both record and reproduce/read the data. In samples 2,3,6 and 7 and comparative example 4, the dyes B1 or B2 are paired with metallized azo dyes in ratios of 0.11:1 to 0.33:1. Useful anions include perchlorate and tetrafluoroborate [0019]

The examiner notes that the (A) compounds used in the cited examples are embraced by formula 3 in claim 4. Again the spectral absorption properties are considered inherent. The rejection stands. **As discussed above, the applicant also fails to treat the use of mixtures, particularly the case where the dye contains a cyanine dye as the organic dye compound and the metalized azo dye which is inherently shown to absorb in the 570-610 nm range.**

The examiner notes that claim 1 does not exclude any particular dyes. The examiner notes that this document does not disclose nitroso compounds and the applicant may wish to close the claims language to exclude other dyes, rather than using the open "comprising" language.

8. Claim 1, 2, 4-9 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umehara et al. JP 08-156408.

With respect to embodiments embraced by claims 2 and 9, the examiner holds that it would have been obvious to one skilled in the art to use other anions with the cyanine dye, such as tetrafluoroborate or perchlorate, in place of the iodide used in the specific examples based upon the disclosure of equivalence of the anions with a reasonable expectation of forming a useful optical recording medium within the scope of the coverage sought as the absorption is dominated by the organic portion of the dye structure.

9. Claims 1, 4, 5-8 and 11-14 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Aihara et al. EP 0676751.

Aihara et al. EP 0676751 teaches examples 15 in table 5 on pages 36 which combines 19 parts of the heptamethine cyanine dye (24) (absorption maxima at 820 nm) with the nickelized azo dye (21) (absorption maxima at 570 nm) in a 81:19 ratio (see pages 33-34) and has an absorbance of 0.2 at 680 and 635 nm. The use of the resultant media with recording of data at

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635 nm and 780 nm is disclosed on page 33. Note that the structures are disclosed in the examples and cyanine dyes used in examples 1-3 have perchlorate anions.

As discussed above, the applicant also fails to treat the use of mixtures, particularly the case where the dye contains a cyanine dye as the organic dye compound and the metalized azo dye which is inherently shown to absorb in the 570-610 nm range.

The examiner notes that this document does not disclose nitroso compounds and the applicant may wish to close the claims language to exclude other dyes, rather than using the open "comprising" language.

10. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Kanno GB 2329751.

See examples 1-3 using styryl dyes and quenchers and comparative examples 1 and 2 using cyanine dyes with quenchers and have perchlorate anions. The quenchers Q-1 through Q-4 are metal complexes (see page 28). Figures 5 and 6 show absorption maxima of ~ 610- 620 nm for the styryl dyes and that these still absorb strongly to approximately 520 nm and would inherently be useful at wavelengths between ~520 and their absorption maxima. See the dyes structures on page 18-19.

The examiner notes that this document does not disclose metallized azo dyes or nitroso compounds, but discloses other metallized compounds as set forth on page 28.

11 Claims 1, 2 and 5-7 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Ootaguro et al. '882.

Ootaguro et al. '882 teaches in examples 54 and 55, the coating of a solution of 3 parts cyanine dye NK 2421 (a heptamethine cyanine dyes with a perchlorate anion, see Maruyama et

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al. below) and 1 part 4-N,N-diethylamino-4'-nitrosodiphenylamine (the ethyl homologue of the compound used in example 1 of the instant specification) (0.33:1 ratio), which is coated on a glass substrate. 4-N,N-diethylamino-4'-nitrosodiphenylamine is disclosed as having a maximum absorption at 440 nm. (24/28). 4-N,N-dimethylamino-4'-nitrosodiphenylamine is also disclosed (6/24-37). These compounds are disclosed as not suffering from the low solubility of other stabilizers, such as metal complexes (2/6-43).

12 Claims 1,2,5-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanba et al. JP 60-204396, in view of Namba et al. '231.

Namba et al. '231 teach the use of mixtures of dyes to cover the entire spectral range. The NK and IR dyes of table III are cyanine dyes with perchlorate counterions. The absorption maxima of the dyes is given in tables I,II and III and the wavelength of useful lasers is disclosed in the table in column 3. These include 325, 442, 488, 514.5 (515), 633 nm.

With respect to embodiments where the laser used is sensitized by dyes other than the "organic dye", the examiner holds that it would have been obvious to modify the teachings of either Nanba et al. JP 60-204396 by adding other dyes to extend their spectral sensitivity and to use the resulting media with shorter wavelength lasers which the media are sensitized to by dyes other than the "organic dye" as taught by Namba et al. '231 with a reasonable expectation of forming media useful with any laser system and so compatible with more optical recording media players or recorders.

What the applicant fails to appreciate is that the use of mixtures of dyes to extend the spectral response of the optical recording media is old and well known to be desirable

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as evidenced by Namba et al. '231 and that this dovetails nicely with the applicant's use of dye mixtures in the examples.

As discussed above, the dye of chemical formula 39 in the examples of the applicant may increase sensitivity in the spectral range desired, but that dye is not mentioned in the claims, so it cannot be relied upon to assert patentability.

13 Claims 1,2,5-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Umehara et al. JP 08-156408 or Aihara et al. EP 0676751, in view of Namba et al. '231.

The absorption of the azo dyes at shorter wavelengths than the cyanine dyes is disclosed by Umehara et al. JP 08-156408 or Aihara et al. EP 0676751, but the use of this absorption of the azo dye may not be obvious over these references alone and accordingly the examiner has added Namba et al. '231 which clearly establishes the use of several dyes with various absorption characteristics to render the media sensitive to various laser wavelengths. With respect to the embodiment where the azo dye is used to sensitize the medium to shorter wavelengths, the examiner holds that it would have been obvious to modify the processes of Umehara et al. JP 08-156408 or Aihara et al. EP 0676751, by using other lasers to which the recording medium would be sensitive due to the absorption of the azo dyes, such as the 633 nm HeNe laser (see figure 7 in Namba et al. '231), with a reasonable expectation of recording data, based upon this sensitivity.

14 Claims 1,2,5-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ootaguro et al. '882, in view of Namba et al. '231.

The absorption of 4-N,N-diethylamino-4'-nitrosodiphenylamine at shorter wavelengths than the cyanine dyes is disclosed by Ootaguro et al. '882, but the use of this absorption of the 4-N,N-diethylamino-4'-nitrosodiphenylamine may not be obvious over these references alone and

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accordingly the examiner has added Namba et al. '231 which clearly establishes the use of several dyes with various absorption characteristics to render the media sensitive to various laser wavelengths. With respect to the embodiment where 4-N,N-diethylamino-4'-nitrosodiphenylamine is used to sensitize the medium to shorter wavelengths, the examiner holds that it would have been obvious to modify the processes of Ootaguro et al. '882, by using other lasers to which the recording medium would be sensitive due to the absorption of 4-N,N-diethylamino-4'-nitrosodiphenylamine or similar nitroso compounds, such as the 442 nm HeNe laser (see figure 7 in Namba et al. '231), with a reasonable expectation of recording data, based upon this sensitivity.

15 Claims 1-3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno GB 2329751, in view of Ootagura et al. '882.

To address the issue of the recited nitroso compounds as an alternative to metal complexes, the examiner holds that it would have been obvious to modify the cited examples of Kanno GB 2329751 by using 4-N,N-diethylamino-4'-nitrosodiphenylamine or similar nitroso compounds disclosed by Ootagura et al. '882 to stabilize the dyes with a reasonable expectation of gaining the benefits ascribed to their improved solubility by Ootagura et al. '882.

16 Claims 1-3, 5-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno GB 2329751, in view of Ootagura et al. '882, further in view of Namba et al. '231.

To address the issue of the use of short wavelength lasers with media resulting from the combination of Kanno GB 2329751 and Ootagura et al. '882, the examiner cites Namba et al. '231 and hold that it would have been obvious to one skilled in the art to modify the processes of Ootaguro et al. '882, by using other lasers to which the recording medium would be sensitive due

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to the absorption of 4-N,N-diethylamino-4'-nitrosodiphenylamine or similar nitroso compounds, such as the 442 nm HeCd laser (see figure 7 in Namba et al. '231), with a reasonable expectation of recording data, based upon this sensitivity.

17 Claims 1-3,5-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno GB 2329751 and Namba et al. '231 and further in view of Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269,274-279 and 398-433 (1964), Huditch et al. '584, Saito et al. '089, JP 64-040388, JP 03-009884, JP 10-119434 or JP 03-032884.

Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269,274-279 and 398-433 (1964) teaches the heptamethine dyes disclosed on pages 244-269 (straight chain) and 274-279 (cyclic containing chain) for claims 15 and 16. These are the same class of dyes shown in formulae 1-20 of the instant specification. See the styryl dyes on pages 398-433 which include those disclosed in formulae 25-33 in the instant specification. See dye VIII on page 252 (comparable to chemical formula 11 of the instant specification) and XIX and text on pages 267-268 (comparable to formula 19 of the instant specification) See also formula XV on page 277. See dye I on page 398, which is comparable to formula 25 of the instant specification. Perchlorate ions as counterions for cyanine dyes are described on page 253, 262,263 and 267 and the use of toluenesulfonate as a counterion is disclosed on pages 278 and 279. Perchlorate ions as counterions for styryl dyes are described on page 413 and 415 and the use of methylsulfonate is disclosed on pages 412,420 and 427.

Huditch et al. '584 in examples 1, 11 and 12 for their cyanine dyes.

Saito et al. '089 in twentieth and twenty first embodiments (cols 22-23). Useful counterions are disclosed in the abstract together with their benefits.

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JP 64-040388 in examples 1 (perchlorate), 2 (tetrafluoroborate), 3 (perchlorate and arylsulfonate counterions) and other examples. Note the counter ions disclosed in the abstract. Please note the absorption data including their absorption maxima.

JP 03-009884 discloses dyes 4 and 5 on page 9 with triethylammonium cations.

JP 10-119434 discloses dyes HP9, HP8 (page 35) and HP2-5 (page 34). Useful counterions are disclosed in the abstract.

JP 03-032884 discloses dyes on page 6 with perchlorate counterions. See also examples 2 (page 8 upper right)

To address the various anions recited with respect to formula 2, in addition to the basis provided above, the examiner asserts that it is old and well known in the art that cyanine and styryl dyes are closely related as evidenced by Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269, 274-279 and 398-433 (1964) and the examiner holds that it would have been obvious to one skilled in the art to modify the combination of Kanno GB 2329751 with Namba et al. '231 by using other counterions known to be useful with cyanine dyes such as those disclosed by Huditch et al. '584, Saito et al. '089, JP 64-040388, JP 03-009884, JP 10-119434 or JP 03-032884 with a reasonable expectation of forming a useful cyanine dyes and that the dye would be useful in optical recording.

18 Claims 1-2, 5-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Namba et al. JP 60-204396 or Ootaguro et al. '882 combined with Namba et al. '231 and further in view of Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269, 274-279 and 398-433 (1964), Huditch et al. '584, Saito et al. '089, JP 64-040388, JP 03-009884, JP 10-119434 or JP 03-032884.

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To address the various anions recited with respect to formula 2, in addition to the basis provided above, the examiner asserts that it is old and well known in the art that cyanine and styryl dyes are closely related as evidenced by Hamer, "The Cyanine Dyes and Related Compounds", pp. 244-269, 274-279 and 398-433 (1964) and the examiner holds that it would have been obvious to one skilled in the art to modify the combination of either Nanba et al. JP 60-204396 or Ootaguro et al. '882 with Namba et al. '231 by using other counterions known to be useful with cyanine dyes such as those disclosed by Huditch et al. '584, Saito et al. '089, JP 64-040388, JP 03-009884, JP 10-119434 or JP 03-032884 with a reasonable expectation of forming a useful cyanine dyes and that the dye would be useful in optical recording.

19 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

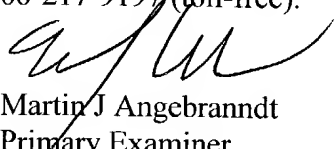
Maruyama et al. '467 discloses cyanine dye A, a heptamethine dye with a perchlorate anion in column 12 and identifies it as being trademarked as NK 2421 in example 1 (column 17).

20 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J Angebrannt
Primary Examiner
Art Unit 1756

12/08/2004